

## 5.14 Waste Management

### 5.14.1 Introduction

The Applicant proposes to develop a solar energy project called the Ivanpah Solar Electric Generating System (Ivanpah SEGS). It will be located in southern California's Mojave Desert, near the Nevada border, to the west of Ivanpah Dry Lake. The project will be located in San Bernardino County, California, on federal land managed by the Bureau of Land Management (BLM). It will be constructed in three phases: two 100-megawatt (MW) phases (known as Ivanpah 1 and 2) and a 200-MW phase (Ivanpah 3). The phasing is planned so that Ivanpah 1 (the southernmost site) will be constructed first, followed by Ivanpah 2 (the middle site), then Ivanpah 3 (the 200-MW plant on the north), though the order of construction may change. Each 100-MW site requires about 850 acres (or 1.3 square miles); the 200-MW site is about 1,660 acres (or about 2.6 square miles). The total area required for all three phases, including the Administration/Operations and Maintenance building and substation, is approximately 3,400 acres. The Applicant has applied for a right-of-way grant for the land from BLM. Although this is a phased project, it is being analyzed as if all phases are operational.

The heliostat (or mirror) fields focus solar energy on the power tower receivers near the center of each of the heliostat arrays (the 100-MW plants have three arrays and the 200-MW plant has four arrays). In each plant, one Rankine-cycle reheat steam turbine receives live steam from the solar boilers and reheat steam from one solar reheater – located in the power block at the top of its own tower. The solar field and power generation equipment are started each morning after sunrise and insolation build-up, and shut down in the evening when insolation drops below the level required to keep the turbine online.

Ivanpah 1, 2 and 3 will be interconnected to the Southern California Edison (SCE) grid through upgrades to SCE's 115-kilovolt (kV) line passing through the site on a northeast-southwest right-of-way. These upgrades will include the construction by SCE of a new 220/115-kV breaker-and-a-half substation between the Ivanpah 1 and 2 project sites. This new substation and the 220-kV upgrades will be for the benefit of Ivanpah and other Interconnection Customers in the region. The existing 115-kV transmission line from the El Dorado substation will be replaced with a double-circuit 220-kV overhead line that will be interconnected to the new substation. Power from Ivanpah 1, 2 and 3 will be transmitted at 115 kV to the new substation. SCE plans to add three new 115-kV lines to increase capacity to the existing El Dorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115-kV line heading southwest. The timing of this upgrade depends upon the development of wind projects ahead in the queue, and is not affected by the Ivanpah SEGS project.

Each phase of the project includes a small package natural gas-fired start-up boiler to provide heat for plant start-up and during temporary cloud cover. The project's natural gas system will be connected to the Kern River Gas Transmission Line, which passes less than half a mile to the north of the project site. Raw water will be drawn daily from one of two onsite wells, located east of Ivanpah 2. Each well will have sufficient capacity to supply water for all three phases. Groundwater will go through a treatment system for use as boiler make-up water and to wash the heliostats. To save water in the site's desert environment, each plant will use a dry-cooling condenser. Water consumption is, therefore, minimal

(estimated at no more than 100 acre-feet/year for all three phases). Each phase includes a small onsite wastewater plant located in the power block that treats wastewater from domestic waste streams such as showers and toilets. A larger sewage package treatment plant will also be located at the Administration Building/Operations and Maintenance area, located between Ivanpah 1 and 2. Sewage sludge will be removed from the site by a sanitary service provider. No wastewater will be generated by the system, except for a small stream that will be treated and used for landscape irrigation. If necessary, a small filter/purification system will be used to provide potable water at the Administration Building.

This subsection describes the applicable laws, ordinances, regulations, and standards (LORS) and the environmental setting. It provides an analysis of the project impacts that could occur as a result of project construction and operation. It also presents protection and mitigation measures that would avoid, minimize, or compensate for adverse impacts when required. At the end of the subsection is a list of agency contracts and permits that would be required.

### 5.14.2 Laws, Ordinances, Regulations, and Standards

Waste handling at Ivanpah SEGS will be governed by federal, state, and local laws. Applicable laws and regulations address proper waste handling, storage, and disposal practices to protect the environment from contamination and protect facility workers and the surrounding community from exposure to both nonhazardous and hazardous waste. The LORS applicable to waste handling at the Ivanpah SEGS facility are summarized in Table 5.14-1. The project will comply with all applicable LORS.

TABLE 5.14-1  
Laws, Ordinances, Regulations, and Standards Applicable to Ivanpah SEGS Waste Management

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
<b>Federal</b>			
Resource Conservation and Recovery Act (RCRA) Subtitle D	Regulates design and operation of solid waste landfills. Ivanpah SEGS solid waste will be collected and disposed of by a collection company in conformance with Subtitle D.	California Integrated Waste Management Board (CIWMB), Nevada Division of Environmental Protection, Solid Waste Branch (NV)	Sections 5.14.2.1, 5.14.4.2.1, 5.14.6
RCRA Subtitle C	Controls storage, treatment, and disposal of hazardous waste. Hazardous waste will be handled by contractors in conformance with Subtitle C.	DTSC	Sections 5.14.2.1, 5.14.4.2.2, and 5.14.6

TABLE 5.14-1

Laws, Ordinances, Regulations, and Standards Applicable to Ivanpah SEGS Waste Management

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
Clean Water Act (CWA)	Controls discharge of wastewater to the surface waters of the U.S. Ivanpah SEGS will discharge sanitary wastewater to an onsite package water treatment system that will comply with CWA requirements.	Regional Water Quality Control Board	Sections 5.14.4.2, 5.14.2.1, and 5.15
<b>State</b>			
California Integrated Waste Management Act (CIWMA)	Controls solid waste collectors, recyclers, and depositors. Ivanpah SEGS solid waste will be collected and disposed of by a collection company in conformance with the CIWMA.	CIWMB	Sections 5.14.2.2, 5.14.4.2.1, 5.14.5, 5.14.7
CA Hazardous Waste Control Law (HWCL)	Controls storage, treatment, and disposal of hazardous waste. Hazardous waste will be handled by contractors in conformance with the HWCL.	DTSC	Sections 5.14.2.2, 5.14.4.1.1.3, 5.14.4.2.2.3, 5.14.4.2.2, 5.14.4.3.2.2, 5.14.7
Porter-Cologne Water Quality Control Act	Controls discharge of wastewater to the surface and ground waters of California. Ivanpah SEGS will include a small package sewage system. Sewage sludge will be removed from the site by a sanitary service.	Regional Water Quality Control Board	Sections 5.14.2.2, 5.14.4.1.1.2, 5.14.4.1.2.2, 5.14.4.3.2.1 and Section 5.15
California Fire Code	Controls storage of hazardous materials and wastes and the use and storage of flammable/combustible liquids. Wastes will be accumulated and stored in accordance with Fire Code requirements. Permits for storage containers will be obtained, as needed, from the San Bernardino County Fire Department.	San Bernardino County Fire Department	Sections 5.14.2.3, 5.14.2.4, and 5.16

### 5.14.2.1 Federal LORS

Wastewater is regulated by the U.S. Environmental Protection Agency (EPA) under the Clean Water Act (CWA). Sanitary wastewater will be processed through package sewage systems (one per unit), and sludge is removed from the site by a sanitary service. (See Section 5.15, Water Resources).

The federal statute that controls both nonhazardous and hazardous waste is the Resource Conservation and Recovery Act (RCRA), 42 USC 6901, et seq. RCRA's implementing regulations for hazardous waste are found at 40 CFR 260, et seq. and for nonhazardous waste at 40 CFR 239 et seq. Subtitle D of RCRA makes the regulation of nonhazardous waste the responsibility of the states; federal involvement is limited to establishing minimum criteria that prescribe the best practicable controls and monitoring requirements for solid waste disposal facilities. Subtitle C controls the generation, transportation, treatment, storage, and disposal of hazardous waste through a comprehensive "cradle-to-grave" system of hazardous waste management techniques and requirements. It applies to all states and to all generators of hazardous waste (above certain levels of waste produced). Ivanpah SEGS will comply with this law in its generation, storage, transport, and disposal of any hazardous waste generated at the facility. The EPA has delegated its authority for implementing the law to the State of California.

#### 5.14.2.2 State LORS

Nonhazardous solid waste is regulated by the California Integrated Waste Management Act (CIWMA) of 1989, found in Public Resources Code (PRC) Section 40000, et seq. This law provides an integrated statewide system of solid waste management by coordinating state and local efforts in source reduction, recycling, and land disposal safety. Counties are required to submit Integrated Waste Management Plans to the state. This law directly affects San Bernardino County and the solid waste hauler and disposer that will collect solid waste from the Ivanpah SEGS. It also affects the Ivanpah SEGS to the extent that hazardous wastes are not to be disposed of with solid waste.

Wastewater is regulated by the State Water Resources Control Board and Regional Water Quality Control Boards under the Porter-Cologne Water Quality Control Act. Sanitary wastewater will be treated in small onsite package sewage treatment systems, and sludge will be disposed of offsite. Stormwater will be managed as described in Section 5.15, Water Resources.

RCRA allows states to develop their own programs to regulate hazardous waste. The programs must be at least as stringent as RCRA. California has developed its own program in the California Hazardous Waste Control Law (HWCL) (Health and Safety Code Section 25100, et seq.). The HWCL performs essentially the same regulatory functions as RCRA and is the law that will regulate hazardous waste at Ivanpah SEGS, since California has elected to develop its own program. However, the HWCL includes California-only hazardous wastes that are not classified as hazardous waste under RCRA. Since hazardous wastes will be generated at the Ivanpah SEGS facility during construction and operation, the HWCL will require the Applicant to adhere to storage, recordkeeping, reporting, and training requirements for these wastes.

#### 5.14.2.3 Local LORS

The County of San Bernardino Solid Waste Management Division will have the responsibility for administering and enforcing the CIWMA for solid, nonhazardous waste for the Ivanpah SEGS project.

For hazardous waste, local regulation consists primarily of the administration and enforcement of the HWCL. The San Bernardino County Certified Unified Program Agency

(CUPA) is the local entity that will regulate hazardous waste at the Ivanpah SEGS project. The San Bernardino County Fire Department is the designated CUPA for San Bernardino County. In addition, San Bernardino has a formally trained Hazardous Materials Response Team to provide assistance during spill cleanup. The County Fire Department will respond and will identify the type and source of the hazardous material or waste, oversee evacuation of people, and confine the spilled material if possible. Cleanup of the material is the responsibility of the facility causing the spill. The San Bernardino County Fire Department Station No. 53 in Baker is the primary fire response unit. The Hazardous Materials response team is located in the City of San Bernardino and has a response time of approximately 3 to 4 hours (Ashbaker, 2007). In addition, there is a mutual aid agreement between San Bernardino County Fire Department and the Clark County Fire Department (Tellez, 2007). The on-call Hazardous Materials Response Team at Station 24 in Las Vegas, Nevada will also respond to spills at the Ivanpah SEGS project (Brenner, 2007).

#### 5.14.2.4 Codes

The design, engineering, and construction of hazardous waste storage and handling systems will be in accordance with all applicable codes and standards, including:

- The Uniform Fire Code
- The Uniform Building Code
- The Uniform Plumbing Code
- California Building Code
- California Fire Code

#### 5.14.3 Affected Environment

A Phase I Environmental Site Assessment (ESA) was conducted by CH2M HILL in accordance with the ASTM Standard E 1527-05, Standard Practice for Environmental Site Assessments. According to this report, the property is currently owned by the federal government and is managed by the BLM. The ESA report, dated August 2007, concluded that no past or present commercial or industrial activities have occurred at the site based on review of historical topographic maps, aerial photos, and a site reconnaissance. Attempts were made to contact a potential leaseholder, Mr. David Hinkson, with no success.

The property is located in a remote desert location and has been undisturbed. No industrial or commercial activities are currently being performed onsite. The nearest land use, the Primm Valley Golf Club is located approximately 0.5 mile to the northeast of the Ivanpah 1 project site. The golf range has the potential to store minor quantities of hazardous materials. Due to the location of the golf range, however, no contamination from its activities are anticipated to impact the project site. The ESA report recommended that in the event that information is received from BLM, the current landowner, or a potential leaseholder, Mr. David Hinkson, an addendum to the report may be provided if the conclusions and recommendations are changed. No recognized environmental conditions were identified at the project site. A copy of the ESA report is included in Appendix 5.14A.

## 5.14.4 Environmental Analysis

### 5.14.4.1 Project Waste Generation

Wastewater, solid nonhazardous waste, and hazardous liquid and solid wastes will be generated at the Ivanpah SEGS site during facility construction and operation.

Nonhazardous solid and liquid wastes will also be generated during the construction of the electric transmission line and the natural gas supply line.

#### 5.14.4.1.1 Construction Phase

During construction, the primary waste generated will be solid nonhazardous waste. However, some nonhazardous liquid waste and hazardous waste (solid and liquid) will also be generated. Most of the hazardous wastes will be generated at the plant site, but a minimal quantity of hazardous waste will be generated during construction of the electric transmission line and natural gas supply line. The types of waste and their estimated quantities are described below and summarized in Table 5.14-2.

TABLE 5.14-2  
Potential Wastes Generated during the Construction Phase at the Ivanpah SEGS Facility

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Scrap wood, steel, glass, plastic, paper, calcium silicate insulation, mineral wool insulation	Construction of facility	Normal refuse	180 tons	Non-hazardous	Recycle and/or dispose of in a Class II or III landfill.
Scrap Metals	Construction of facility	Parts, containers	30 tons	Non-hazardous	Recycle and/or dispose of in a Class III landfill.
Empty hazardous material containers	Construction of facility	Drums, containers, totes	100 containers*	Hazardous and non-hazardous solids	Containers < 5 gallons will be disposed as normal refuse. Containers > 5 gallons will be returned to vendors for recycling or reconditioning.
Spent welding materials	Construction of facility	Solid	1 ton	Hazardous	Disposal at a Class I landfill.
Waste oil filters	Construction equipment and vehicles	Solids	200 lbs/mo	Non-hazardous	Recycle at a permitted treatment, storage, and disposal facility (TSDF).
Used and waste lube oil	ST lube oil flushes and equipment vehicles	Hydrocarbons	12,000 gallons (life of project construction)	Hazardous	Recycle at a permitted TSDF.
Oily rags, oil sorbent excluding lube oil flushes	Cleanup of small spills	Hydrocarbons	3,000 lbs during construction	Hazardous	Recycle or dispose at a permitted TSDF.
Solvents, paint, adhesives	Construction of facility	Varies	180 lbs/mo	Hazardous	Recycle at a permitted TSDF.

TABLE 5.14-2  
Potential Wastes Generated during the Construction Phase at the Ivanpah SEGS Facility

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Spent lead-acid batteries	Equipment and Trucks	Heavy metals	10 batteries per year	Hazardous	Store no more than 10 batteries (up to 1-year)—recycle offsite.
Spent alkaline batteries	Equipment	Metals	50 batteries per month	Universal Waste solids	Recycle or dispose offsite at a Universal Waste Destination Facility.
Steam turbine cleaning waste	Pre-boiler piping	Corrosive cleaning chemicals	200 gallons before plant startup	Hazardous or non-hazardous liquid	Dispose at a permitted TSDF.
Sanitary waste	Portable toilet holding tanks	Sewage sludge	Approx, 200 gal/day	Non-Hazardous Liquid	Remove by contracted sanitary service.
Fluorescent, mercury vapor lamps	Lighting	Metals and polychlorinated biphenyls (PCB)	100 lbs/yr	Universal Waste solids	Recycle or dispose offsite at a Universal Waste Destination Facility.
Passivating and chemical cleaning fluid waste	Pipe cleaning and flushing	Varies	200,000 to 400,000 gallons (life of project construction)	Hazardous or non-hazardous liquid	Sample and characterize—if clean, dispose of in sanitary sewer; otherwise, manage appropriately offsite.
Hydrotest water	Testing equipment and piping integrity	Water	400,000 gallons (life of project construction)	Hazardous or non-hazardous liquid	Sample and characterize—if clean, discharge to the surrounding area; otherwise, manage appropriately offsite (See Section 5.15).

\* Containers include < 5-gallon containers and 55-gallon drums or totes

### ***Nonhazardous Solid Waste***

Listed below are nonhazardous waste streams that could potentially be generated from construction of the solar generating facilities, the electric transmission lines, and gas supply line.

Paper, Wood, Glass, Plastics, and Concrete. Paper, wood, glass, and plastics will be generated from packing materials, waste lumber, insulation, and empty nonhazardous chemical containers. Approximately 7.5 tons of these wastes will be generated on a monthly basis during project construction. These wastes will be recycled where practical. Waste that cannot be recycled will be disposed of weekly in a Class III landfill. Onsite, the waste will be placed in dumpsters.

Metal. Metal will include steel from welding/cutting operations, packing materials, and empty nonhazardous chemical containers. Aluminum waste will be generated from packing materials and electrical wiring. Approximately 24 tons of waste metal (based on 2,000 lbs per month over 24 months) will be generated during construction. Waste will be recycled where practical and nonrecyclable waste will be deposited in a Class III landfill.

### ***Nonhazardous Wastewater***

Nonhazardous wastewater will be generated, including sanitary wastewater, equipment washwater, stormwater runoff, and wastewater from pressure testing the gas supply line. Sanitary waste will be collected in portable, self-contained toilets. Equipment washwater will be contained at specifically designated wash areas and disposed of offsite at a licensed facility accepting such wastes. Stormwater runoff will be managed in accordance with the contractor-developed stormwater pollution prevention plan (SWPPP) that will be approved by the appropriate agencies prior to the start of construction. [See Appendix 5.15B for a draft Drainage, Erosion, and Sediment Control Plan (DESCP)].

The gas supply pipeline hydrostatic test water will be filtered to collect any sediment and welding fragments. The water will be collected, tested, and disposed of by the pipeline contractor, as described in Section 4, Natural Gas Supply.

### ***Hazardous Waste***

Most of the hazardous waste generated during construction will consist of liquid waste, such as flushing and cleaning fluids, passivating fluid (to prepare pipes for use), and solvents. Some hazardous solid waste, such as welding materials and dried paint, may also be generated.

Flushing and cleaning waste liquid will be generated when pipes and boilers are cleaned and flushed. Passivating fluid waste is generated when high temperature pipes are treated with either a phosphate or nitrate solution. The volume of flushing and cleaning and passivating liquid waste generated is estimated to be one to two times the internal volume of the pipes cleaned. The quantity of welding, solvent, and paint waste is expected to be minimal.

The construction contractor will be considered the generator of hazardous construction waste and will be responsible for proper handling of hazardous waste in compliance with all applicable federal, state, and local laws and regulations, including licensing, personnel training, accumulation limits and times, and reporting and recordkeeping. The hazardous waste will be collected in satellite accumulation containers near the points of generation. It will be moved daily to the contractor's 90-day hazardous waste storage area, located at the site construction laydown area. The waste will be removed from the site by a certified hazardous waste collection company and delivered to an authorized hazardous waste management facility, prior to expiration of the 90-day storage limit.

#### **5.14.4.1.2 Operation Phase**

During Ivanpah SEGS facility operation, the primary waste generated will be nonhazardous solid waste. However, varying quantities of both solid and liquid hazardous waste will also be generated periodically. The types of waste and their estimated quantities are discussed below.

### ***Nonhazardous Solid Waste***

The majority of nonhazardous waste will be sanitary sewer sludge, from the small sewage treatment unit, that will be shipped offsite to landfill and water treatment filters (granular activated carbon [GAC] vessels, mixed bed vessels, and the de-ionization trailer from the onsite water treatment unit). The Ivanpah SEGS facility will also produce maintenance and generating facility wastes, typical of power generation operations. These will include rags,



broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, the typical refuse generated by workers and small office operations, and other miscellaneous solid wastes. The quantity generated is estimated to be about 235 tons per year excluding sewer sludge. Large metal parts will be recycled.

### *Nonhazardous Wastewater*

A water balance diagram for a 100-MW plant is provided in Figure 2.2-5. It illustrates the expected wastewater streams and flow rates for the Ivanpah 1 and 2 generating facilities. For the 200 MW (Ivanpah 3) plant, the water streams would be approximately doubled.

In addition, the sanitary wastewater collection treatment systems will collect sanitary wastewater from sinks, toilets, and other sanitary facilities, pass it through package treatment plants with the liquid waste being used for landscape irrigation.

Plant Drains-Oil/Water Separator. General facility drainage will consist of plant raw water use such as area washdown, equipment leakage, and drainage from facility equipment areas. If cleaning chemicals are not used, water from these areas will be collected in a system of drains, hub drains, sumps, and piping and routed to the oil/water separator, and then to the waste collection tank. From there, the water will flow through a filter system and be sent back to the raw water storage tank for additional treatment prior to use at the facility.

### *Hazardous Waste*

Hazardous waste generated will include waste lubricating oil, used oil filters, and chemical cleaning wastes. They will consist of alkaline and acidic cleaning solutions used during chemical cleaning of the boiler system turbine. These wastes generally contain high concentrations of heavy metals and will be collected for offsite disposal.

Non hazardous and hazardous wastes that potentially would be generated at the facility are summarized in Table 5.14-3.

TABLE 5.14-3  
Potential Wastes Generated during Operations at the Ivanpah SEGS Facility

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Lubricating oil	Small leaks and spills from the steam turbine lubricating oil system and routine maintenance of the steam turbine	Hydrocarbons	200 gallons per Steam Turbine, or 600 gallons per maintenance event	Hazardous	Recycled by certified oil recycler
Lubricating oil filters	Steam turbine lubricating oil system	Paper, metal, and hydrocarbons	1,500 lb/yr	Hazardous	Recycled by certified oil recycler
Solvents, paint, adhesives	Operation of facility	Varies	180 lbs/mo	Hazardous	Recycle at a permitted TSDF
GAC unit	Water Treatment Process	Metal and resins	Vessels changed out monthly	Non-Hazardous	Recycled by water treatment manufacturer

**TABLE 5.14-3**  
Potential Wastes Generated during Operations at the Ivanpah SEGS Facility

<b>Waste</b>	<b>Origin</b>	<b>Composition</b>	<b>Estimated Quantity</b>	<b>Classification</b>	<b>Disposal</b>
De-ionization Trailer unit	Water Treatment Process	Metal and resins	Trailer changed out weekly	Non-Hazardous	Recycled by water treatment manufacturer
Mixed Bed Vessels	Water Treatment Process	Metal and resins	Vessels changed out monthly	Non-Hazardous	Recycled by water treatment manufacturer
Oily rags	Maintenance, wipe down of equipment, etc.	Hydrocarbons, cloth	900 lb/yr (~800 rags/yr)	Hazardous	Recycled by certified oil recycler
Oil sorbents	Cleanup of small spills	Hydrocarbons	600 lb/yr	Hazardous	Recycled or disposed of by certified oil recycler
Sewage Sludge	On-site sanitary sewage treatment system	Sewage Sludge	Approx. 200 gallons/day	Non-Hazardous	Sent offsite to sewage treatment facility

#### 5.14.4.2 Waste Disposal Sites

Nonhazardous solid waste (often referred to as solid waste, municipal solid waste [MSW], or garbage) will be recycled or deposited in a Class III landfill. Hazardous wastes, both solid and liquid, will be delivered to a permitted offsite Treatment, Storage, and Disposal (TSD) facility for treatment or recycling or deposited in a permitted Class I landfill. The following subsections describe the waste disposal sites feasible for disposal of Ivanpah SEGS wastes.

##### 5.14.4.2.1 Nonhazardous Waste

Several solid waste non-exclusive franchise services provide garbage collection services for facilities in the project site area. The closest option to the proposed facility is the Sloan Transfer Station in Las Vegas, Nevada. The station is located approximately 35 miles from the Ivanpah location. It serves as a transfer point that services the Apex Regional Landfill on the north side of Las Vegas. Both facilities are owned and operated by Republic Services ([www.republicservicesvegas.com](http://www.republicservicesvegas.com)). Neither the landfill, nor the transfer station has a limit on waste handled per day. Through conversations with representatives from both the landfill and the transfer station, the waste produced during construction and operation of the facility would be an insignificant rise in their daily totals (McCallister, 2007). A secondary option, Barstow Sanitary Landfill, is located in Barstow, California. It currently has 218,492 cubic yards remaining and a daily permitted throughput of 750 tons. According to the CIWMB, there are no open enforcement actions against Barstow Sanitary Landfill and no violations have been noted for this facility during monthly inspections in the 2006 calendar year (CIWMB, 2007). Table 5.14-4 provides additional details regarding solid waste disposal facilities in the vicinity of the project site.

TABLE 5.14-4  
Solid Waste Disposal Facilities in the Vicinity of the Ivanpah SEGS Project

Landfill/MRF/ Transfer Station	Location	Class	Permitted Capacity (cubic yards)	Remaining Capacity (cubic yards)	Permitted Throughput (tons per day)	Estimated Closure Date	Enforcement Actions Taken
Sloan Transfer Station <sup>a</sup>	Las Vegas, NV (Outside of Sloan, NV)	N/A	No Cap	No Cap	No Cap	N/A	None
Apex Regional Landfill <sup>a</sup>	Las Vegas, NV (North of City)	N/A	5,967,744	4,840,019	No Cap	1/1/2175	Yes <sup>c</sup>
Barstow Sanitary Landfill <sup>b</sup>	Barstow, CA	III	3,584,500	218,492	750	5/1/2012	None

<sup>a</sup> Nevada information provided by phone conversation (McCallister, 2007 and LaBruzzo, 2007).

<sup>b</sup> Barstow Information from CIWMB Solid Waste Information System Database (SWIS) (CIWMB, 2007).

<sup>c</sup> Notice of Violation received due to shared permit with crushing facility that did not complete air permit before scheduled due date.

#### 5.14.4.2.2 Hazardous Waste

Hazardous waste generated at Ivanpah SEGS will be stored at that facility for less than 90 days. The waste will then be transported by a licensed hazardous waste transporter to a TSD facility. These facilities vary considerably in what they can do with the hazardous waste they receive. Some can only store waste, some can treat the waste to recover usable products, and others can dispose of the waste by incineration, deep-well injection, or landfilling. (Incineration and deep-well injection are not currently permitted in California.)

According to the California Department of Toxic Substances Control (DTSC), there are 61 facilities in California that can accept hazardous waste for treatment and recycling (DTSC, 2007). For ultimate disposal, California has the three hazardous waste (Class I) landfills described below. The closest commercial hazardous waste disposal facility is the Clean Harbors' Buttonwillow Landfill in Kern County.

##### *Clean Harbors' Buttonwillow Landfill in Kern County*

This landfill is permitted at 14.3 million cubic yards (CIWMB, 2006 and Buoni, 2007) and has approximately 9.2 million cubic yards of remaining space as of February 2006 (Buoni, 2007). At the current deposit rate, the landfill is permitted to accept waste until 2040 (CIWMB, 2006). Buttonwillow has been permitted to accept all hazardous wastes except flammables, PCBs with a concentration greater than 50 parts per million, medical waste, explosives, and radioactive waste with radioactivity greater than 1,800 picocuries (Buoni, 2007).

##### *Clean Harbors' Westmorland Landfill in Imperial County*

This facility is not currently open and accepting waste because the Buttonwillow facility can accommodate the current hazardous waste generation rate. The facility is, however, available in reserve and could be reopened if necessary. Even if opened, the landfill's conditional use permit prohibits the acceptance of some types of waste, including radioactive (except geothermal) waste, flammables, biological hazard waste (medical), PCB, dioxins, air- and water-reactive wastes, and strong oxidizers.

### ***Waste Management's Kettleman Hills Landfill in Kings County***

This facility accepts Class I and II waste. The facility has several landfill units, including the B-18 landfill unit. The B-18 Landfill is permitted for and will accept all hazardous wastes except radioactive, medical, and unexploded ordinance; this landfill has permitted capacity of 10 million cubic yards with a remaining capacity of approximately 2.6 million cubic yards as of June 2007 (Luibel, 2007). The life expectance remaining for Landfill B-18 is about 3 years; however, expansion of the facility is anticipated (Luibel, 2007). Expansion of the facility would extend the closure date to 2036 (Yarbrough, 2005).

### ***Additional Commercial Hazardous Waste Treatment and Recycling Facilities***

In addition to hazardous waste landfills, there are numerous offsite commercial liquid hazardous waste treatment and recycling facilities in California. Some of the closest facilities include Safety Kleen Corp., Clean Harbors, Industrial Service Oil Co., Inc., and Pacific Resource Recovery Services in Los Angeles, Rho-Chem Corp. in Inglewood, Onyx Environmental in Azusa, Filter Recycling in Rialto, Advanced Environmental in Fontana, and Demenno Kerdoon in Compton (DTSC, 2007).

#### **5.14.4.3 Waste Management Methods and Mitigation**

The handling and management of waste generated by Ivanpah SEGS will follow the hierarchical approach of source reduction, recycling, treatment, and disposal. The first priority will be to reduce the quantity of waste generated through pollution prevention methods (e.g., high-efficiency cleaning methods). The next level of waste management will involve the reuse or recycle of wastes (e.g., used oil recycling). For wastes that cannot be recycled, treatment will be used, if possible, to make the waste non-hazardous (e.g., neutralization). Finally, offsite disposal will be used to dispose of residual wastes that cannot be reused, recycled, or treated. The following subsections present methods for managing both nonhazardous and hazardous waste generated by Ivanpah SEGS.

##### **5.14.4.3.1 Construction Phase**

Nonhazardous solid waste generated during construction will be collected in onsite dumpsters and taken to the Sloan Transfer Station, Barstow Sanitary Landfill or another local landfill. Recyclable materials can be segregated and transported by construction contractors or other private haulers to an area recycling facility.

Wastewater generated during construction will include sanitary waste and could include equipment washwater and stormwater runoff. Sanitary waste will be collected in portable, self-contained toilets. Equipment washwater will be contained at designated wash areas and will be disposed of offsite at an approved wastewater disposal facility. Stormwater runoff will be directed to an onsite infiltration/evaporation area and will be managed in accordance with the project's stormwater management permit, which will be obtained prior to the start of construction (see Section 5.15, Water Resources). The generation of nonhazardous wastewater will be minimized through water conservation and reuse measures.

Most of the hazardous waste generated during construction will consist of liquid waste, such as flushing and cleaning fluids, passivating fluids, and solvents. Some solid waste in the form of welding materials and dried paint may also be generated. Nonhazardous materials will be used whenever possible to minimize the quantity of hazardous waste

generated. The construction contractor will be the generator of hazardous construction waste and will be responsible for proper handling in compliance with all applicable federal, state, and local laws and regulations, including licensing, training of personnel, accumulation limits and times, and reporting and recordkeeping. The hazardous waste will be collected in satellite accumulation containers near the points of generation. This waste will be moved daily to the contractor's 90-day hazardous waste storage area, located at the plant construction laydown area. The waste will be delivered to an authorized hazardous waste management facility, prior to the expiration of the 90-day storage limit.

#### 5.14.4.3.2 Operation Phase

The primary waste generated during the operation phase will be nonhazardous wastewater. Other nonhazardous solid waste will also be generated, as well as varying quantities of liquid and solid hazardous waste. Handling and mitigation of these wastes is described in the following subsections.

##### *Nonhazardous Wastes*

Wastewater from facility sinks and toilets will be discharged to onsite packaged sewage systems (one system per power block). Treated wastewater will be used in local landscaping, and the sludge will be removed from the site by a sanitary service. Nonhazardous plant wastewater will be recycled through the onsite water treatment system consisting of GAC units, mixed bed vessels, and a de-ionization trailer. Recycled plant wastewater will be used for steam boiler makeup water, mirror washing, and other facility processes.

Nonhazardous solid waste or refuse will be collected and deposited in a local landfill. Whenever possible, recycling will be implemented throughout the facility to minimize the quantity of nonhazardous waste that must be disposed of in a landfill.

##### *Hazardous Wastes*

To avoid the potential effects on human health and the environment from the handling and disposal of hazardous wastes, procedures will be developed to ensure proper labeling, storage, packaging, recordkeeping, and disposal of all hazardous wastes. The following general procedures will be employed:

- Ivanpah SEGS will be classified as a hazardous waste generator. Prior to facility startup, application will be made to DTSC for a California hazardous waste generator identification number.
- Hazardous wastes will not be stored onsite for more than 90 days and will be accumulated according to CCR Title 22 requirements.
- Hazardous wastes will be stored in appropriately segregated storage areas surrounded by berms to contain leaks and spills. The bermed areas will be sized to hold the full contents of the largest single container and, if not roofed, sized for an additional 20 percent to allow for rainfall. These areas will be inspected daily.
- Hazardous wastes will be collected by a licensed hazardous waste hauler, using a hazardous waste manifest. Wastes will only be shipped to authorized hazardous waste management facilities. Biannual hazardous waste generator reports will be prepared

and submitted to DTSC. Copies of manifests, reports, waste analyses, and other documents will be kept onsite and remain accessible for inspection for at least 3 years.

- Employees will be trained in hazardous waste procedures, spill contingencies, and waste minimization.
- Procedures will be developed to reduce the quantity of hazardous waste generated. Nonhazardous materials will be used instead of hazardous materials whenever possible, and wastes will be recycled whenever possible.

Specifically, hazardous waste handling will include the following practices. Handling of hazardous wastes in this way will minimize the quantity of waste deposited to landfills.

- Waste lubricating oil will be recovered and recycled by a waste oil recycling contractor. Spent oil filters and oily rags will be recycled.
- Spent GAC vessels, the mixed bed vessels and de-ionization trailers will be recycled by the supplier.

#### **5.14.4.3.3 Facility Closure**

When Ivanpah SEGS is closed at the end of its operating life cycle, both nonhazardous and hazardous wastes must be handled properly. Closure can be temporary or permanent. Temporary closure would be for a period of time greater than the time required for normal maintenance, including overhaul or replacement of the steam turbine. Causes for temporary closure could be a disruption in the supply of natural gas, flooding of the site, or damage to the plant from earthquake, fire, storm, or other natural causes. Permanent closure would consist of a cessation in operations with no intent to restart operations and could be due to the age of the plant, damage to the plant beyond repair, economic conditions, or other unforeseen reasons. Handling of wastes for these two types of closure are discussed below.

##### ***Temporary Closure***

For a temporary closure, where there is no release of hazardous materials, facility security will be deployed on a 24-hour basis, and the CEC will be notified. Depending on the length of shutdown necessary, a contingency plan for the temporary cessation of operations will be implemented. This plan will be prepared prior to Ivanpah SEGS startup. The plan will be developed to ensure conformance with all applicable LORS and the protection of public health and safety and the environment. The plan, depending on the expected duration of the shutdown, could include draining all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. All wastes will be disposed of according to applicable LORS, as discussed in Section 5.14.2.

Where the temporary closure is in response to facility damage, or where there is a release or threatened release of hazardous waste or materials into the environment, procedures will be followed as set forth in a Hazardous Materials Business Plan (HMBP). The HMBP is described in Section 5.5.6.4. Procedures include methods to control releases, notification of applicable authorities and the public, emergency response, and training for generating facility personnel in responding to and controlling releases of hazardous materials and hazardous waste. Once the immediate problem of hazardous waste and materials release is contained and cleaned up, temporary closure will proceed as described for a closure where there is no release of hazardous materials or waste.

### *Permanent Closure*

The planned life of the generation facility is 50 years, though operation could be longer. When the facility is permanently closed, the handling of nonhazardous materials will be part of a general closure plan that will attempt to maximize the recycling of all facility components (see Section 2.4). Unused chemicals will be sold back to the suppliers or other purchasers or users. All equipment will be drained of chemicals and shut down to protect public health and safety and the environment. All nonhazardous wastes will be collected and disposed of in appropriate landfills or waste collection facilities. All hazardous wastes will be disposed of according with the applicable LORS. The site will be secured 24 hours per day during the Ivanpah SEGS decommissioning activities.

### **5.14.5 Cumulative Effects**

A cumulative effect refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Pub. Resources Code § 21083; Cal. Code Regs., Title 14, §§ 15064(h), 15065(c), 15130, and 15355). Cumulative projects are described in Section 5.6.7 and include the Desert Xpress Rail Line, improvements to Interstate 15, Las Vegas Valley Water District Pipeline, Southern Nevada Supplemental Airport (Ivanpah Valley Airport), and Table Mountain Wind Generating Facility. Although environmental analyses for most of these projects have not been completed at the time of preparation of this Application for Certification, standard mitigation measures exist to reduce waste management impacts to a less-than-significant level.

The Ivanpah SEGS facility will generate nonhazardous solid waste that will add to the total waste generated in San Bernardino County, California and Clark County, Nevada. However, there is adequate recycling and landfill capacity in both California and Nevada to recycle and dispose of the waste generated by the Ivanpah SEGS project. It is estimated that the plant will generate approximately 280 tons of solid waste during construction and about 240 tons a year from operations (including approximately 4 tons of hazardous waste). Compared to the total amount of solid waste landfilled in San Bernardino County in the year 2006 of 1,862,461 tons and Clark County landfill capacity of 1,360,000,000 tons, the Ivanpah SEGS project's contribution will represent less than 1 percent of total county waste disposal (CIWMB, 2007 and Simpson, 2007). Therefore, the impact of the project on solid waste recycling and disposal capacity is not significant. The increased demand on solid waste recycling and disposal capacity by the Ivanpah SEGS would not result in significant cumulative waste management impacts.

Hazardous waste generated during operation of Ivanpah SEGS will consist of waste oil, filters, GAC units, mixed bed vessels, the de-ionization trailer, and fluids used to clean the boilers and steam turbines. The waste oil, GAC units, mixed bed vessels, and de-ionization trailers will be recycled or disposed of off site. Hazardous waste treatment and disposal capacity in California and Nevada is more than adequate. Therefore, the effect of Ivanpah SEGS on hazardous waste recycling, treatment, and disposal capability is not significant. The increased demand on hazardous waste recycling, treatment, and disposal capability by the Ivanpah SEGS would not result in significant cumulative waste management impacts.

### 5.14.6 Mitigation and Monitoring

Because the environmental impacts caused by wastes generated during construction and operation of the facility are expected to be insignificant, extensive monitoring programs will not be required. Generated waste, both nonhazardous and hazardous, will be monitored during project construction and operation in accordance with the monitoring and reporting requirements mandated by the regulatory permits to be obtained for construction and operation.

### 5.14.7 Involved Agencies and Agency Contacts

Several agencies, including EPA at the federal level and the DTSC of the California Environmental Protection Agency at the state level, regulate nonhazardous and hazardous waste and will be involved in the regulation of the waste generated by the Ivanpah SEGS project. The waste laws, however, are administered and enforced primarily through the San Bernardino County Fire Department, which is the designated CUPA. The persons to contact for nonhazardous and hazardous waste management are listed in Table 5.14-5.

TABLE 5.14-5  
Agency Contacts for Ivanpah SEGS Waste Management

Issue	Agency	Contact
<b>Nonhazardous Waste</b>		
Solid Waste and Recycling	County of San Bernardino Department of Public Works—Solid Waste Management Division	Peter Wulfman, Division Manager 222 W. Hospitality Lane Second Floor San Bernardino, CA. 92415-0017 (909) 386-8701 email: pwulfman@swm.sbcounty.gov
<b>Hazardous Waste</b>		
Hazardous Waste Compliance and Inspections	San Bernardino County Fire Department—Hazardous Materials Division—Certified Unified Program Agency Program	Doug Snyder, Supervisor 620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 email: dsnyder@sbcfire.org

### 5.14.8 Permits Required and Permit Schedule

Information regarding the storage of hazardous wastes at the project site will be included in the HMBP submitted to the San Bernardino County Fire Department as described in Section 5.5, Hazardous Materials. In addition, the Fire Department requires the permit listed in Table 5.14-6.



**TABLE 5.14-6**  
Permits Required and Permit Schedule for Ivanpah SEGS Waste Management

Permit	Agency Contact	Schedule
Aboveground Storage Tank Permit	Carleen Wiley San Bernardino County Fire Department Hazardous Materials Division, CUPA Program 620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 email: Cwiley@sbcfire.org	Prior to storage of hazardous wastes in aboveground storage tanks.

### 5.14.9 References

Ashbaker, Joe. 2007. San Bernardino County Fire Department Hazardous Materials Team. Personal communication with Lucas Bair/CH2M HILL. May 21.

Brenner, Richard. 2007. Clark County HazMat Coordinator. Personal communication with Lucas Bair/CH2M HILL. May 24.

Buoni, Marianna. 2007. Clean Harbor's Buttonwillow Landfill. Personal communication with John Putrich/CH2M HILL. June 11.

California Integrated Waste Management Board (CIWMB). 2006. Solid Waste Information System (SWIS) Database. May.

California Integrated Waste Management Board (CIWMB). 2007. *2006 Landfill Summary Tonnage Report*. <http://www.ciwmb.ca.gov/Landfills/Tonnages/>. June 26.

DTSC. 2007. Department of Toxic Substance Control (DTSC). *California Commercial Offsite Hazardous Waste Management Facilities*. March 12.

LaBruzzo, Paul. 2007. Sloan Transfer Station. Personal communication with John Putrich/CH2M HILL. May 30.

Luibel, Helen. 2007. Waste Management Inc., Kettleman Hills Facility. Personal communication, with John Putrich/CH2M HILL. June.

McCallister, Robert. 2007. Apex Regional Landfill. Personal communication with John Putrich/CH2M HILL. June 6.

Simpson, Dave. 2007. Nevada Division of Environmental Protection. Personal communication with John Putrich/CH2M HILL. July 10.

Tellez, Dan. 2007. San Bernardino County Fire Department Captain. Personal communication with Crystahl Taylor/CH2M HILL. May 18.

Yarbrough, T. 2005. Waste Management Inc., Kettleman Hills Facility. Personal communication with Sarah Madams/CH2M HILL. November 16.